

DESCRIPTION OF THE DRAWINGS

The foregoing and other objects, aspects and advantages are better understood from the following detailed description of a preferred embodiment of the invention with reference to the drawings, in which:

Figure 1 is a block diagram of a representative hardware environment in accordance with a preferred embodiment;

Figure 2 is a block diagram of a system architecture in accordance with a preferred embodiment;

Figure 3 depicts the timeline and relative resource requirements for each phase of development for a typical application development in accordance with a preferred embodiment;

Figure 4 illustrates a small segment of a domain model for claims handlers in the auto insurance industry in accordance with a preferred embodiment;

Figure 5 illustrates an insurance underwriting profile in accordance with a preferred embodiment;

Figure 6 illustrates a transformation component in accordance with a preferred embodiment;

Figure 7 illustrates the use of a toolbar to navigate and access application level features in accordance with a preferred embodiment;

Figure 8 is a GBS display in accordance with a preferred embodiment;

Figure 9 is a feedback display in accordance with a preferred embodiment;

Figure 10 illustrates a journal entry simulation in accordance with a preferred embodiment;

Figure 11 illustrates a simulated Bell Phone Bill journal entry in accordance with a preferred embodiment;

Figure 12 illustrates a feedback display in accordance with a preferred embodiment;

Figure 13 illustrates the steps of the first scenario in accordance with a preferred embodiment;

Figure 14 and 15 illustrate the steps associated with a build scenario in accordance with a preferred embodiment;

Figure 16 illustrates a test scenario in accordance with a preferred embodiment. The test students work through the journalization activity;

Figure 17 illustrates how the tool suite supports student administration in accordance with a preferred embodiment;

Figure 18 illustrates a suite to support a student interaction in accordance with a preferred embodiment;

Figure 19 illustrates the remediation process in accordance with a preferred embodiment;

Figure 20 illustrates the objects for the journalization task in accordance with a preferred embodiment;

Figure 21 illustrates the mapping of a source item to a target item in accordance with a preferred embodiment;

Figure 22 illustrates an analysis of rules in accordance with a preferred embodiment;

Figure 23 illustrates a feedback selection in accordance with a preferred embodiment;

Figure 24 is a flowchart of the feedback logic in accordance with a preferred embodiment;

Figure 25 is a block diagram setting forth the architecture of a simulation model in accordance with a preferred embodiment;

Figure 26 illustrates the steps for configuring a simulation in accordance with a preferred embodiment;

Figure 27 is a block diagram presenting the detailed architecture of a system dynamics model in accordance with a preferred embodiment;

Figure 28 is an overview diagram of the logic utilized for initial configuration in accordance with a preferred embodiment;

Figure 29 is a display of video information in accordance with a preferred embodiment; and

Figure 30 illustrates an ICA utility in accordance with a preferred embodiment.

DETAILED DESCRIPTION

A preferred embodiment of a system in accordance with the present invention is preferably practiced in the context of a personal computer such as an IBM compatible personal computer, Apple Macintosh computer or UNIX based workstation. A representative hardware environment is depicted in Figure 1, which illustrates a typical hardware configuration of a workstation in accordance with a preferred embodiment having a central processing unit 110, such as a microprocessor, and a number of other units interconnected via a system bus 112. The workstation shown in Figure 1 includes a Random Access Memory (RAM) 114, Read Only Memory (ROM) 116, an I/O adapter 118 for connecting peripheral devices such as disk storage units 120 to the bus 112, a user interface adapter 122 for connecting a keyboard 124, a mouse 126, a speaker 128, a microphone 132, and/or other user interface devices such as a touch screen (not shown) to the bus 112, communication adapter 134 for connecting the workstation to a communication network (e.g., a data processing network) and a display adapter 136 for connecting the bus 112 to a display device 138. The workstation typically has resident thereon an operating system such as the Microsoft Windows NT or Windows/95 Operating System (OS), the IBM OS/2 operating system, the MAC OS, or UNIX operating system. Those skilled in the art will appreciate that the present invention may also be implemented on platforms and operating systems other than those mentioned.

A preferred embodiment is written using JAVA, C, and the C++ language and utilizes object oriented programming methodology. Object oriented programming (OOP) has become increasingly used to develop complex applications. As OOP moves toward the mainstream of software design and development, various software solutions require adaptation to make use of the benefits of OOP. A need exists for these principles of OOP to be applied to a messaging interface of an electronic messaging system such that a set of OOP classes and objects for the messaging interface can be provided. A simulation engine in accordance with a preferred embodiment is based on a Microsoft Visual Basic component developed to help design and test feedback in relation to a Microsoft Excel spreadsheet. These spreadsheet models are what simulate actual business functions and become a task that will be performed by a student. The Simulation Engine accepts simulation inputs and calculates various outputs and notifies the system of the status of the simulation at a given time in order to obtain appropriate feedback.

Relationship of Components

The simulation model executes the business function that the student is learning and is therefore the center point of the application. An activity 'layer' allows the user to visually guide the simulation by passing inputs into the simulation engine and receiving an output from the simulation model. For example, if the student was working on an income statement activity, the net sales and cost of goods sold calculations are passed as inputs to the simulation model and the net income value is calculated and retrieved as an output. As calculations are passed to and retrieved from the simulation model, they are also passed to the Intelligent Coaching Agent (ICA). The ICA analyzes the Inputs and Outputs to the simulation model and generates feedback based on a set of rules. This feedback is received and displayed through the Visual Basic Architecture.

Figure 2 is a block diagram of a system architecture in accordance with a preferred embodiment. The Presentation 'layer' 210 is separate from the activity 'layer' 220 and communication is facilitated through a set of messages 230 that control the display specific content topics. A preferred embodiment enables knowledge workers 200 & 201 to acquire complex skills rapidly, reliably and consistently across an organization to deliver rapid acquisition of complex skills. This result is achieved by placing individuals in a simulated business environment that "looks and feels" like real work, and challenging them to make decisions which support a business' strategic objectives utilizing highly effective learning theory (e.g., goal based learning, learn by doing, failure based learning, etc.), and the latest in multimedia user interfaces, coupled with three powerful, integrated

software components. The first of these components is a software Solution Construction Aid (SCA) 230 consisting of a mathematical modeling tool 234 which simulates business outcomes of an individual's collective actions over a period of time. The second component is a knowledge system 250 consisting of an HTML content layer which organizes and presents packaged knowledge much like an online text book with practice exercises, video war stories, and a glossary. The third component is a software tutor 270 comprising an artificial intelligence engine 240 which generates individualized coaching messages based on decisions made by learner.

Feedback is unique for each individual completing the course and supports client cultural messages 242 "designed into" the course. A business simulation methodology that includes support for content acquisition, story line design, interaction design, feedback and coaching delivery, and content delivery is architected into the system in accordance with a preferred embodiment. A large number of "pre-designed" learning interactions such as drag and drop association of information 238, situation assessment/action planning, interviewing (one-on-one, one-to-many), presenting (to a group of experts/executives), metering of performance (handle now, handle later), "time jumping" for impact of decisions, competitive landscape shift (while "time jumping", competitors merge, customers are acquired, etc.) and video interviewing with automated note taking are also included in accordance with a preferred embodiment.

Business simulation in accordance with a preferred embodiment delivers training curricula in an optimal manner. This is because such applications provide effective training that mirrors a student's actual work environment. The application of skills "on the job" facilitates increased retention and higher overall job performance. While the results of such training applications are impressive, business simulations are very complex to design and build correctly. These simulations are characterized by a very open-ended environment, where students can go through the application along any number of paths, depending on their learning style and prior experiences/knowledge.

A category of learning approaches called Learn by Doing, is commonly used as a solution to support the first phase (Learn) of the Workforce Performance Cycle. However, it can also be a solution to support the second phase (Perform) of the cycle to enable point of need learning during job performance. By adopting the approach presented, some of the benefits of a technology based approach for building business simulation solutions which create more repeatable, predictable projects resulting in more perceived and actual user value at a lower cost and in less time are highlighted.

Most corporate training programs today are misdirected because they have failed to focus properly on the purpose of their training. These programs have confused the memorization of facts with the ability to perform tasks; the knowing of "that" with the knowing of "how". By adopting the methods of traditional schools, businesses are teaching a wide breadth of disconnected, decontextualized facts and figures, when they should be focused on improved performance. How do you teach performance, when lectures, books, and tests inherently are designed around facts and figures? Throw away the lectures, books, and tests. The best way to prepare for high performance is to perform; experience is the best teacher! Most business leaders agree that workers become more effective the more time they spend in their jobs. The best approach for training novice employees, therefore, would be letting them learn on the job, acquiring skills in their actual work environment. The idea of learning-by-doing is not revolutionary, yet it is resisted in business and academia. Why is this so, if higher competence is universally desired?

Learners are reluctant to adopt learning-by-doing because they are frightened of failure. People work hard to avoid making mistakes in front of others. Business leaders are hesitant to implement learning-by-doing because novice failure may have dramatic safety, legal and financial implications. Imagine a novice pilot learning-by-doing as he accelerates a large jet plane